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## TABLE OF CONTENTS

The Way It Looks to Us ..... 322
Dr. E. F. Kelly Dies ..... 324
Pharmacy's War Service Record Broadcast ..... 326
Recent Advances Against Tuberculosis ..... 328
Inaugural Address of A. PH. A. President ..... 333
Uses of Ultraviolet Rays in Pharmacy ..... 337
Digest of Operating Statements ..... 342
Prescription Information Service ..... 343
Annual Index ..... 347

*Practical Pharmacy Edition*

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**COVER:** Dr. E. F. Kelly, 1879–1944.

(*See pages 322 and 324.*)

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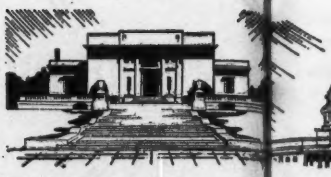

# The Way I

## A Great Leader Passes

DR. E. F. KELLY is dead. None of us who had the honor of working with him daily can yet realize or accept that fact. One evening he shuffled some papers into his ever-present brief case, said his usual cheery good-bye and was gone. He never came back.

What this means to American pharmacy is all too clear to the thousands who have been associated with him and must be apparent to the thousands of others who knew him only through his work in their behalf. Dr. Kelly's personality, ability and perseverance have built a living monument of achievement that will everlastingly memorialize the man and sustain the profession to which he dedicated his life.

This dedication to all that is best in pharmacy, a profound integrity and an unwavering gentlemanliness were present in a measure that has not been surpassed by anyone we have known. During twenty years as A. PH. A. Secretary he built these qualities into the structure of this growing professional organization and inspired his co-workers to maintain similar ideals.

We often sat together in his office at the AMERICAN INSTITUTE OF PHARMACY talking ideas and ideals, plans and problems, long after the deepening dusk warned that his good wife had dinner waiting. He was saddened by some of the things some did in the name of pharmacy. He *never* became discouraged nor lost faith in the importance and destiny of the profession. He was keenly analytical and therefore often constructively critical, in his compassionate way, of the passing parade of events in pharmacy—but was the last to impugn motives.

To the stranger, Dr. Kelly's great and good wisdom was hidden by a modest manner and a slight stature. Yet, all who knew him—and this company included many of the great and near great—looked up to him for counsel and guidance in things pharmaceutical. Constant tact and diplomacy were his forte—some thought it a fault. But this characteristic often reconciled many a hopelessly deadlocked conflict both within pharmacy and in our relationship with other groups.

The A. PH. A. Secretary's career started in a corner pharmacy. His hand and heart always remained interlocked with the American retail pharmacist wherever he might be.

The accomplishments of his lifetime add up to a record that has never been surpassed in the history of American pharmacy, a record that will inspire others who will follow him in the decades to come.

As a retail pharmacist Dr. Kelly served the health needs of his community and later worked untiringly to increase pharmacy's service to every community in the nation and to improve the recognition and reward of the retail pharmacist.

As a manufacturing pharmacist he played an important role in the development of a great pharmaceutical laboratory and later as a national leader did much to improve drug standards and to develop a community of interests between manufacturing and retail pharmacy.

As an educator Dr. Kelly headed the development of a pharmacy college and taught in schools of dentistry and medicine, later championing higher educational requirements for the pharmacist and accreditation standards for the nation's colleges.

Finally as Secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION he was in constant touch with government officials and played an important role in securing a Pharmacy Corps in the Army, in obtaining just legislation for the protection of public

# Looks To Us

health and in improving the status of pharmacists in federal agencies.

His organizational work was never limited to the A. PH. A., and he was particularly interested in strengthening the state associations. Under his guidance the A. PH. A. broadened its scope of service to pharmacy and gained representation in worth-while scientific endeavors of related fields. In a very real sense the AMERICAN INSTITUTE OF PHARMACY and all it represents is a monument to Dr. Kelly.

Through the nearly twenty years of Washington turmoil in which he served, Dr. Kelly never lost sight of the basic objectives of the ASSOCIATION nor of the long-range good of the profession as a whole. While others were zigzagging over the surface of pharmacy's problems like water bugs darting from one ephemeral objective to another, or making one big splash then sinking down to oblivion, Dr. Kelly pulled with strong stroke through one turbulent crisis after another.

But in 1944 the tides were running strong. The burden was even greater than the aging secretary had known in younger days. Although never relaxing his efforts on behalf of American pharmacy he asked that a younger man carry on. But it was too late. An illness precipitated by overwork led to his death on October 27.

The man, his achievements and his sacrifices will not be forgotten. Every pharmacist pays tribute to a great pharmacist. A responsibility rests with us all to preserve the progress he fostered and to strive toward the ideals to which he was dedicated.

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## Asking for Competition

SOME pharmacists seem to have caught a rose-colored view of what self-service selling can do for them and are looking forward to remodeling their pharmacies with this in mind. Self-service has been highly successful in groceries and some merchandising drugstores. It is a technique that will be extended after the war.

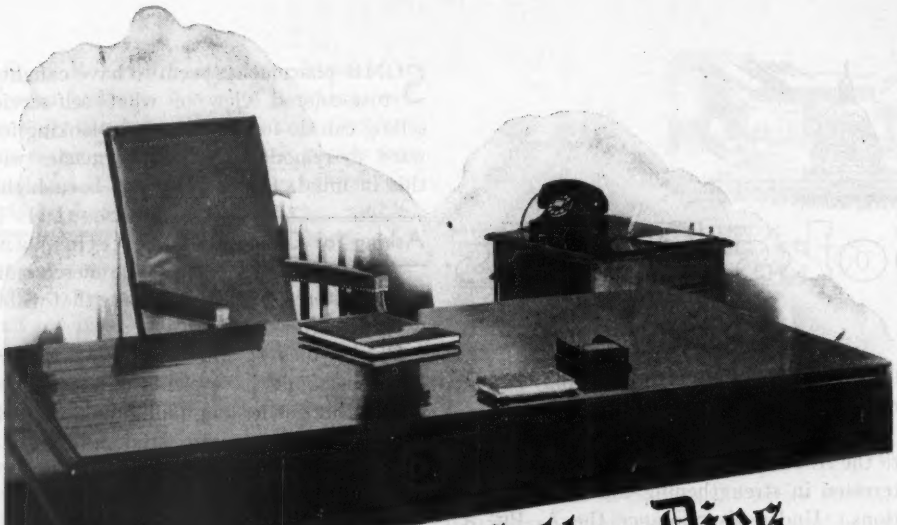
The virtues of lower overhead and reduced personnel have plenty of appeal these days. But on the long pull, how many self-service drugstores can maintain a position as the community health center and as a professional institution?

Better service through professional knowledge is the pharmacist's greatest protection against more competition from other outlets for packaged products. Self-service would throw overboard this special service and safeguard which convinces the public that health supplies should be secured in your pharmacy.

Another merchandising trend in all types of pharmacies is departmentalization—and it is a welcome one. If a pharmacist cannot primarily practice pharmacy, then at least the categories of products related to pharmacy can be set apart—both physically and in the public mind—from other drugstore services.

Under this arrangement a good argument can be made for setting up non pharmaceutical departments so that patrons may have self-service if they so desire.

Self-service on drugs is approved by only 38% of women shoppers, however, according to a much-discussed survey by the Scripps-Howard newspapers. Let's remember that this practice got the nod from only a minority. There is no telling how strongly the "aye" voters hold their opinions, but we will wager that if given the choice between the personal attention and guidance of a professional pharmacist and their own selection of drugs, the homemakers will choose the counsel of their pharmacist.



# Dr. E. F. Kelly Dies

**SECRETARY KELLY'S CHAIR AT THE AMERICAN INSTITUTE OF PHARMACY IS VACANT AFTER NINETEEN YEARS OF SERVICE, AS PHARMACY MOURNS THE PASSING OF A GREAT LEADER**

IN THE dark morning of Friday, October 27, at 4:45 a.m., Dr. E. F. Kelly died. His life ended in the same quiet, uncomplaining manner in which he had lived and labored. The last weeks of the A. PH. A. Secretary's eventful career were spent at the family's quiet country homestead in Texas, Md.

Dr. Kelly had gone there to try to regain his health which had been broken, according to physicians, by nervous strain and overwork. Following his collapse on August 8, he had gradually gained strength and in September was permitted a few brief contacts with friends outside the family.

Two weeks before his death, however, a relapse occurred progressing to coma. Several physicians had been unable to discover organic disease, although cerebral arteriosclerosis was recorded as the terminal diagnosis.

Funeral services at the family home were attended by about 150 of Dr. Kelly's close friends on October 30. Final rites and burial were held on November 4 at Union, N. C.

Thus, after a lifetime of service to pharmacy, he returned to the small North Carolina town where he was born on July 2, 1879, the son of John Evander and Penelope Kelly.

It was here, in Union, that Dr. Kelly's interest in pharmacy was aroused when about twenty years of age. For a year he worked in a pharmacy at Green Cove Springs, Fla., and was later employed in retail pharmacies in Baltimore and Washington.

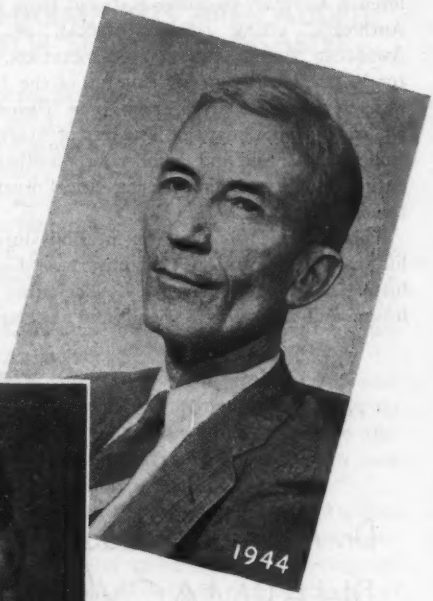
He had come North to study under the famous pharmacist, Dr. Charles Caspari, Jr., at the Maryland College of Pharmacy, which is now part of the University of Maryland. After graduation in 1902, he was retained as Dr. Caspari's assistant and four years later was appointed associate professor.

Meanwhile, Dr. Kelly's ability had come to the

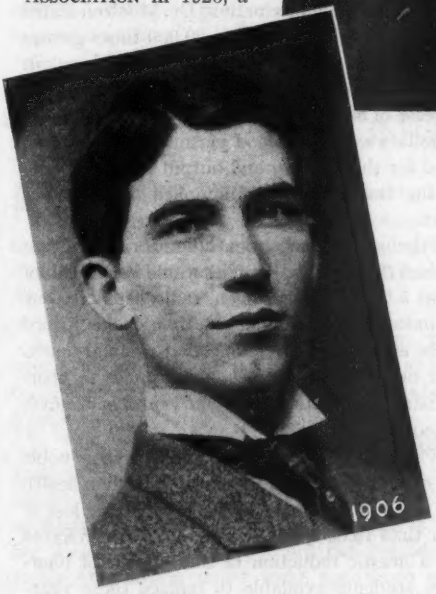
attention of Louis Dohme. The young pharmacist was employed as manager of the Sharp and Dohme laboratory stock room and advanced to the position of superintendent.

In 1911 he resigned from the Sharp and Dohme staff to devote more time to pharmaceutical education, although continuing as a consultant in manufacturing pharmacy for several years.

After Dr. Caspari's death, Dr. Kelly was appointed dean of the Maryland College of Pharmacy in 1918 and served until 1926. From 1916 to 1922 Dr. Kelly was also professor of chemistry at the University of Maryland Dental School. For more than 25 years he had been lecturer in pharmacy at the Johns Hopkins Medical School.



Dr. Kelly was active in the AMERICAN PHARMACEUTICAL ASSOCIATION since 1905, first helping to organize a local branch in Baltimore. By 1918 he was second vice-chairman of the House of Delegates, advancing to the post of chairman, and then served as ASSOCIATION treasurer. Dr. Kelly was elected Secretary of the ASSOCIATION in 1926, a position he held until the time of his death.




Under his leadership the organization greatly expanded its services to the profession and joined with allied fields in public health work. He played an important role in the founding and development of the AMERICAN INSTITUTE OF PHARMACY.

In recognition of Dr. Kelly's many contributions to pharmacy he received the Remington Medal in 1933, the profession's highest award, and in the same year was given an honorary doctorate of science from Temple University.

Additional offices and memberships Dr. Kelly held include Maryland Board of Health (since 1920), secretary Maryland Pharmaceutical Association (1907–1942), U. S. P. Revision Committee (1920–1930), U. S. P. Board of Trustees (since 1930, chairman since 1940), Pharmacopœial Convention (since 1910), American Council of Pharmaceutical Education (since 1932), vice president American Association of Colleges of Pharmacy (1921), American Association for the Advancement of Science, Maryland Academy of Sciences, secretary-treasurer Drug Trade Con-

ference, secretary-treasurer National Drug Code Authority, acting editor JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, editor PRACTICAL PHARMACY EDITION of the JOURNAL, reviser Caspari's *Treatise on Pharmacy*, chairman of the board of Trustees of Maryland Endowment Fund and membership on other scientific committees and pharmaceutical organizations.

This monument of achievement, built during a life span of 65 years, has been unsurpassed in the history of American pharmacy. The entire profession and thousands of friends and associates in allied fields mourn the passing of a great leader.

Dr. Kelly is survived by his widow, Mrs. Marian Low Kelly; a son, Maj. Evander F. Kelly; a son, Kenneth L. Kelly; and a daughter, Mrs. Kathleen Kilgore. Maj. Kelly is now serving in England. A third son, Lauchlin, was reported to have lost his life in a bombing mission over Germany last December.

Mrs. Kelly, Kenneth and Kathleen will continue to live at their apartment residence, 1511 Twenty-second Street, N. W., Washington, D.C., although maintaining the family home in Texas, Md.

## Dr. Moulton Broadcasts

# PHARMACY'S WAR SERVICE RECORD

PHARMACY'S contributions to the war effort were presented to the public Saturday afternoon, November 4, by Dr. George A. Moulton, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, in a broadcast over the Yankee Network.

Speaking on the occasion of Pharmacy Week, Dr. Moulton recalled the critical situation which existed during World War I when America was cut off from German-made medical supplies and emphasized how a similar situation was averted in the present conflict by the "battle of supply that the drug industry and the profession of pharmacy have valiantly carried out both on the war fronts and on the home front."

"It is a story," said Dr. Moulton, "of titanic accomplishment by our chemists in discovering substitutes for lost sources of supply, by our pharmaceutical manufacturers in doubling and redoubling output of vital medicines, of the wholesale druggists in constantly improving their distribution setups to meet ever-changing needs, and of self-sacrifice by individual pharmacists both in serving increased public health demands at home and in actual life saving on the battlefronts."

In making the United States the drug arsenal of the world, Dr. Moulton pointed out that pharmaceutical ingenuity devised substitutes for each imported drug we lost and that medications have been modified to include new discoveries which assure maximum health protection to both civilians and the armed forces.

Emphasizing the monumental accomplishment of American drug production, Dr. Moulton stated that the penicillin output is 20,000 times greater than it was a year ago and the cost has been cut by 85% . . . atabrine is produced by the ton, an increase of 8000% in two years' time . . . millions of dollars worth of blood plasma has been processed for the military and output is limited only by the amount of blood supplied on the home front.

Although pharmaceutical laboratories were first advised that medical supplies would be needed for about 5,000,000 servicemen, radio listeners were reminded that "today, even though our armed forces are more than double that original figure, their needs are being met and supplies to pharmacists for protection of civilian health have never lagged.

"Practicing pharmacists have played a noble role on the home front in guarding civilian health . . . ," Dr. Moulton said, "in spite of the loss of more than 14,000 pharmacists to the armed forces and a drastic reduction in the number of pharmacy students available to replace those phar-

macists lost through death or retirement.

"Typical of the tremendous wartime job of the pharmacists is the record of prescriptions filled. Normally about 200,000,000 prescriptions were filled a year, but during the war pharmacists have filled more than 230,000,000 prescriptions per year—thus helping the decreased number of physicians in the country perform their important job. In this way," he declared, "pharmacists have again demonstrated their importance as partner-consultant of physicians."

In addition to professional service, Dr. Moulton explained, retail pharmacists have joined wholeheartedly in the civic war programs of their communities, have sold bonds and have actively recruited cadet nurses for the armed forces.

Citing the Coconut Grove fire, the Ringling Bros. Circus fire and the recent amusement park fires in the East, Dr. Moulton told his radio audience of the personal heroism and devotion to the duty of protecting public health that have characterized the pharmacist's service in time of emergency. He then went on to give examples of the host of instances where pharmacists serving in the armed forces have performed feats of courage and professional skill beyond the call of duty.

"The public service rendered by pharmacists will not end when the war is won," Dr. Moulton concluded. "Theirs has always been a never-ending battle to preserve and protect the health of every community in close cooperation with the medical profession."

## PHARMACISTS ARE LAUDED FOR SERVICE IN DISASTER

Pharmacists in Cleveland's east side district were going about their duties on October 20 much like any other day. But at 2:40 p. m. the gas storage explosion that started the city's most devastating fire soon transformed their pharmacies into crowded first aid stations.

How well they upheld the tradition of their profession is indicated in a letter from Mayor Frank J. Lausche of Cleveland to Earl J. Albrecht, president of the Northern Ohio Druggists Association:

"Please convey my warm personal appreciation and gratitude to each one of the druggists who in a spirit of selfless service helped to alleviate the suffering and distress of a stricken community," said Mayor Lausche.

"These men by their quick thinking and action, their ability to respond with calmness and courage in the face of an emergency, and their application of professional skill with no thought of personal reward or recognition, deserve the thanks of communities everywhere. It is by such examples of service that the neighborhood pharmacy has, in truth, become a community health center."

More than 200 persons burned or in shock were given first aid treatment by pharmacists, it was estimated, before medical service became available.

## NEW CHANGES IN U. S. P. XII AUTHORIZED

Four changes in U. S. P. XII authorized by the Eighth Sheet Supplement are of especial interest to the retail pharmacist. They become effective immediately and will be enforceable after April 1.

1. Racemic menthol, a synthetic form, has been made official since it is now accepted as the equivalent of the official laevo menthol obtained from botanical sources.

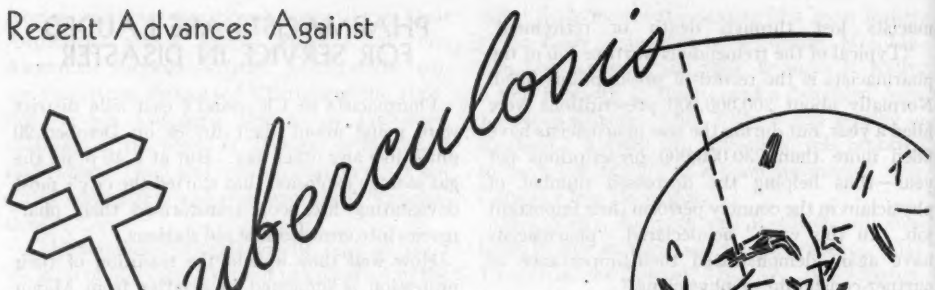
2. The formula for Elixir of Phenobarbital given in U. S. P. XII has been reinstated as the official formula. The special wartime formula authorized in the First Bound Supplement is being discontinued because it did not provide a stable preparation under some conditions and sufficient glycerin is now available to permit the use of the original formula in the Pharmacopœia.

3. Because of the shortage of Oil of Cinnamon it may be replaced by an equal volume of Cinnamaldehyde in preparing Aqua Cinnamomi and Spiritus Cinnamomi.

4. Because of the shortage of Oil of Anise this oil may be replaced by an equal volume of Anethol in preparing Aqua Anisi, Fluidextractum Cascarae Sagradae Aromaticum, Spiritus Anisi, Spiritus Aurantii Compositus, Syrupus Sarsaparillae Compositus and Tinctura Opii Camphorata.

For a copy of these and other changes authorized by the Eighth U. S. P. XII Sheet Supplement write to the U. S. Pharmacopœia, 43rd Street and Woodland Avenue, Philadelphia 4, Pa.

# Recent Advances Against Tuberculosis



**SULFONE DRUGS MAY OPEN A NEW APPROACH TO CONTROL OF THE DISEASE WITH HIGHEST MORTALITY AMONG AMERICANS BETWEEN 15–45**

SINCE Pearl Harbor more Americans have been killed by tuberculosis than by enemy bombs and bullets. Each Yuletide season the Christmas seal campaign underscores the continuing need for united action by public health agencies to control and conquer the ravages of the tubercle bacillus.

This year there is new hope that drug therapy may at last provide an effective treatment. Interest has centered on three derivatives of diaminodiphenylsulfone: diasone (disodium formaldehyde sulfoxylate diaminodiphenylsulfone), promin (sodium *p,p'*-diaminodiphenylsulfone N,N'-didextrose sulfonate) and promizole (4,2'-diaminophenyl-5'-thiazolesulfone).

Despite glowing reports in the lay press and some other publications, none of the three has been proved sufficiently effective and safe for general distribution. None has been subjected to controlled clinical study. While there are indications that all three drugs may have some value as an adjunct to other methods of treatment, the therapeutic effect is not sufficiently striking to make it certain, in the absence of adequate controls, just what influence the drugs have had in reported cases of clinical improvement.

To avoid false hopes and disappointment, pharmacists should tell inquiring physicians and patrons that all of the sulfones are still experimental therapeutic agents and will not be available in the near future. Meanwhile, experiments are continuing in a number of clinics and laboratories.

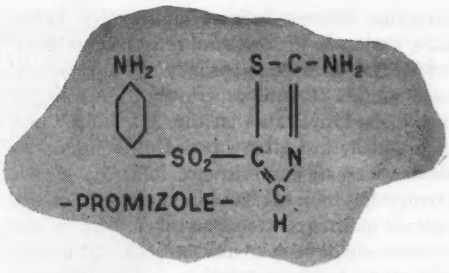
Studies on diasone are probably most advanced. Raiziss and his co-workers, who reported on the synthesis and chemical properties of the drug in the Scientific Edition of THIS JOURNAL, point out that diasone first received attention because of its effectiveness against streptococcic and pneumococcic infections of mice.

Later other workers found that diasone favorably altered the course of experimental tuberculosis in guinea pigs. Few clinical data have been reported in the medical literature although investigations have been under way in several sanatoriums. Both the National Tuberculosis Association and the American Trudeau Society have committees which are now trying to evaluate this chemotherapeutic agent.

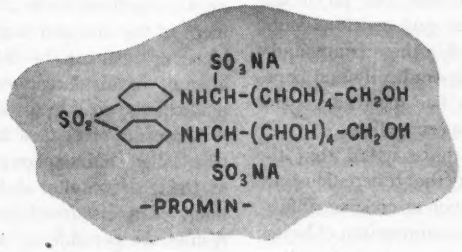
Tests on experimental tuberculosis in guinea pigs led Callomon and Groskin to conclude that diasone is preferable to the related drug, promin, mainly because of lower toxicity.

After tests on animals had shown that promin inhibited the development of tuberculosis much like diasone, limited clinical trials were under-

taken, particularly at the Mineral Springs Sanatorium, Cannon Falls, Minnesota, in cooperation with the Mayo Clinic. Experiments have shown, according to Hinshaw, Pfuetze and Feldman, that prolonged administration of promin orally is clinically feasible and that the results obtained justify further work. Observation of a small series of cases since 1941 indicates that the reversal of unfavorable clinical trends following administration of promin for four to twelve months, which was previously reported, has continued. The Mayo workers, however, "found it difficult to state with absolute conviction that chemotherapy was the crucial factor in the recovery of any of these patients from tuberculosis."

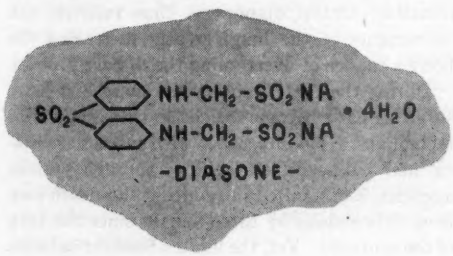



At the National Leprosarium in Louisiana, physicians of the U. S. Public Health Service who have tried promin consider it the most encouraging experimental treatment for leprosy they have used. The tests were suggested by the fact that the bacteria which cause tuberculosis and leprosy are closely related morphologically. Commenting on the use of promin, the physicians state that they "consider it an advance in the right direction in the chemotherapy of leprosy and hope that further synthesis of the sulfa chemicals will produce a product which has specific properties against *M. leprae* and *M. tuberculosis*."




A further step toward this goal came with the synthesis of promizole in 1942 and its subsequent trial on both experimental tuberculosis in guinea pigs and clinical cases. Workers at the Mayo Foundation report that promizole is comparable to diasone and promin in its ability to convert progressively destructive disease in guinea pigs to an arrested or nonprogressive stage in which morbid changes may be resolved. It apparently has the great advantage of being much less toxic than other drugs that have shown some action against tuberculosis.

That promizole has little, if any, of the hemotoxic properties that have so limited the clinical application of other sulfones seems to be demonstrated by a preliminary report on the treatment of 56 patients by Hinshaw and co-workers. Because of the lack of adequate controls and the small number of patients treated with promizole to date, clinical results cannot yet be evaluated satisfactorily.




Hinshaw says: "Present incomplete evidence indicates that promizole is at least as effective as any previously described compound in the treatment of experimental tuberculosis of guinea pigs but is unique among the numerous compounds which we have studied in being easily administered, well absorbed and of extremely low toxicity for human beings.

"Clinical studies in chemotherapy of tuberculosis and of leprosy have been sufficiently encouraging to arouse hopes that chemotherapy of mycobacterial diseases eventually might attain a practical stage of development."

An interesting sidelight on current research is the unexpected "immunity" which develops in infected guinea pigs after chemotherapy. At least two different research teams have reported experiments which show that guinea pigs may live many months after discontinuance of successful chemotherapy, even though fully virulent bacilli can be found in their organs. This is of

particular interest because guinea pigs, unlike man, possess so little natural resistance to tuberculosis that an infection usually runs a rapid and fatal course. Recent experiments, some as yet unpublished, indicate that the "immunity" may be gradually lost after a period of months. No similar increase in resistance following chemotherapy has been observed in human beings, and because natural resistance to tuberculosis in man is extremely difficult to measure, it would be very difficult to demonstrate.

## Search for Effective Drug

Efforts to find an effective drug for the treatment of tuberculosis have been in progress for centuries. The search for a chemotherapeutic agent appears to have been originally stimulated by Ehrlich's researches on arsenicals for the treatment of syphilis.

Since that time pharmacists and physicians have studied gold, copper and calcium salts, guiacol, sulfonamides and other compounds. Although some have been sporadically and hopefully tried clinically, none has received general acceptance as having any specific effect.

Many pharmacists will have noted that the standard prescriptions for the tuberculous are usually a cough sedative, such as codeine sulfate, and an expectorant, such as ammonium chloride.

There is no doubt that thousands of undiagnosed cases advance beyond hope of cure due to self-medication with sedatives and expectorants for a "cold that hangs on" or "chronic bronchitis." Pharmacists should keep this in mind when patrons request over-the-counter dispensing for such conditions. Expectorants containing iodides even produce irritative reactions of tuberculous lesions and may activate an otherwise dormant case.

Contrary to popular belief, the characteristic symptoms of hemorrhage, marked loss of weight, lack of appetite, etc., do not show up in a large percentage of cases until the disease is far advanced. Furthermore, tuberculosis often assumes the guise of relatively harmless infections of the upper respiratory tract. Prompt medical diagnosis often means the difference between speedy recovery and years of invalidism or death.

This is emphasized by the fact that at present, and at least in the immediate future, physicians must rely primarily on aiding the patient's natural defense mechanism to overcome the disease. In pulmonary tuberculosis, by far the most prevalent type, this means some form of rest. Few chest specialists any longer believe that change of climate or fresh air "cures" are an important factor in recovery, except in selected cases.

While rest in bed is usually an indispensable part of the regimen, surgery has devised ways of holding the diseased lung almost completely at rest. When both lungs are infected both can be held partially at rest. A sedentary patient can get along on the oxygen supplied by only a fraction of his lung capacity. Modern refinements in this technique are saving thousands of lives each year.

The objective of all surgical methods of this type is collapse of the lung. The first such procedure to be developed, and now most widely used, is called pneumothorax. Air is introduced between the chest wall and the lung through a small needle, which overcomes the natural vacuum in the chest cavity. This restricts the movement of the diseased lung, and the degree of collapse or rest can be adjusted by varying the amount of air introduced. Periodic refills are made as the air is gradually absorbed.

A second procedure is to remove sections of ribs, called thoracoplasty, which reduces the area of the chest cavity and partially collapses the lung. The disadvantage of the operation is that results are permanent, while pneumothorax can be discontinued when the lung has healed. This, plus the seriousness of the operation, has largely limited its use to those cases in which other measures are inadequate or cannot be used.

## Crushing Nerves

Lung collapse can also be achieved by cutting or, more commonly, crushing the phrenic nerve. The two branches of this nerve run from the brain down each side of the neck and terminate in the diaphragm. By surgically crushing the nerve on the side of the infected lung, that side of the diaphragm is temporarily paralyzed. The immobile arched diaphragm thus restricts the movements of the lung, greatly increasing the body's chance of overcoming the disease process.

During the past twenty years more and more surgeons have become trained in these successful techniques. This, together with increased clinical and public health facilities through various agencies, has resulted in reducing the death rate from tuberculosis by three-fourths since the turn of the century. Yet, the limited funds of patients

and of local health departments and inadequate case finding programs have permitted tuberculosis to remain in first place among fatal diseases of Americans in the age group between 15 and 45.

Therefore a new national attack on the problem will soon get under way through the Tuberculosis Control Division just established in the U. S. Public Health Service. Surgeon General Thomas Parran has picked a young Minnesotan, Dr. Herman E. Hilleboe, to head the campaign.

Representatives of the Public Health Service have been out consulting with the states to see how much money and what facilities will be needed. Dr. Hilleboe and his associates are now going over the data and sometime in December expect to present to Congress their war budget against tuberculosis. An appropriation up to $10,000,000 for 1945 was authorized in July.

No federally controlled and Washington administered program is contemplated in the usual sense. Instead about 85% of the funds will be distributed as grants-in-aid to states on request, with allotments based on population, extent of the problem and financial need. Part of the funds will be matched by state appropriations.

Medical and nursing staffs will be increased, laboratories improved and clinical and x-ray facilities installed under plans developed by each state. Local mobile x-ray units, using the new economical miniature films, will tour the country-side, hunting for unsuspected cases which may be spreading the infection to family and friends.

About a tenth of the funds will be used by the U. S. Public Health Service itself for a public and professional demonstration program to try to make the knowledge and use of tuberculosis control methods available to every community in the country.

About 5% of the funds for the new program is expected to go into research on promising new drugs and other new methods of control and, through cooperation of other research groups, to correlate work already done. If, as now seems likely, an effective chemotherapeutic agent for tuberculosis is developed, it will at one stroke greatly reduce the annual toll of the disease in lives and money. In this, pharmacy—through research, manufacturing laboratories, and retail and hospital pharmacies—will play an important role.

## INACTIVATOR MAKES BACTERIA RESISTANT TO PENICILLIN

Bacteria, particularly staphylococci, often become resistant to penicillin because of inadequate dosage. In other cases, a resistant strain of a bacterium will be encountered in patients who have never before received penicillin. This latter complication, at least, appears to be caused by a highly potent penicillin inactivator which was extracted from penicillin-resistant strains of *Staph. aureus* by Dr. William M. M. Kirby of the Stanford University School of Medicine (*Science*, 99: 452, 1944). No inactivation of penicillin was produced by extracts of penicillin-sensitive strains.

Further studies of the inactivator are under way which may show whether or not it is the same enzyme-like substance, called penicillinase, obtained from *E. coli* by Dr. E. P. Abraham and E. Chain (*Nature*, 146: 837, 1940). This substance was found to completely inhibit penicillin. A still more effective penicillin inhibitor in extracts of paracolon bacilli has been reported by Dr. G. J. Harper (*Lancet*, 2: 569, 1943).

## SOLUTIONS OF PENICILLIN HAVE UNEXPECTED STABILITY

Penicillin solutions made from the sodium salt now being prepared by pharmaceutical laboratories are much more stable than the early cruder

lots. Observations by Dr. M. M. Kirby of San Francisco (*J. Am. Med. Assoc.*, 125: 629, 1944) show "that one or two days' supply of penicillin solution can now be mixed and left at the patient's bedside without danger of deterioration."

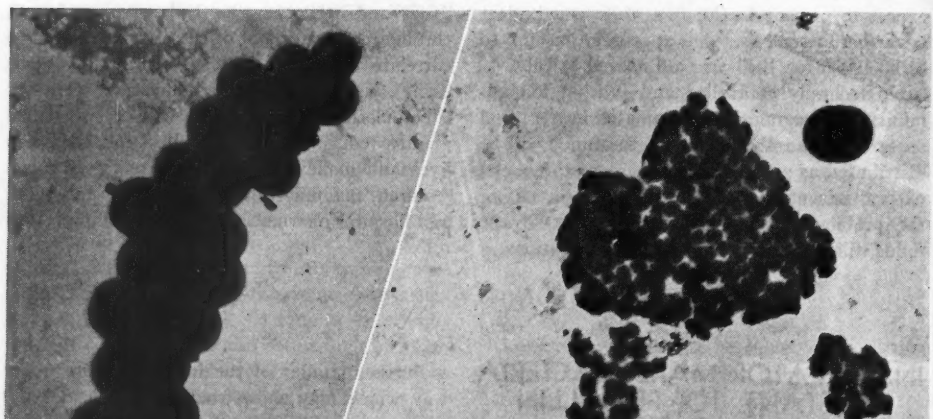
Penicillin is supplied with instructions to keep the solutions refrigerated under 5° C. except when being administered. Because it has been uncertain just how strictly this precaution must be observed, many physicians have given frequent intermittent injections instead of continuous intravenous drip, or have replenished the bedside supply at hourly intervals to avoid possible deterioration.

To learn whether these technical difficulties could be avoided, 1-unit-per-cc. dilutions of penicillin from eight pharmaceutical laboratories were kept at room temperature (about 22° C.), at 37° C. and at 2° C. Daily titrations of activity based on turbidity caused by a hemolytic streptococcus inoculum were made.

At room temperature there was no evidence of deterioration in any of the preparations during the first seven days. Most of the preparations retained their full potency for ten days but gradually declined in strength thereafter.

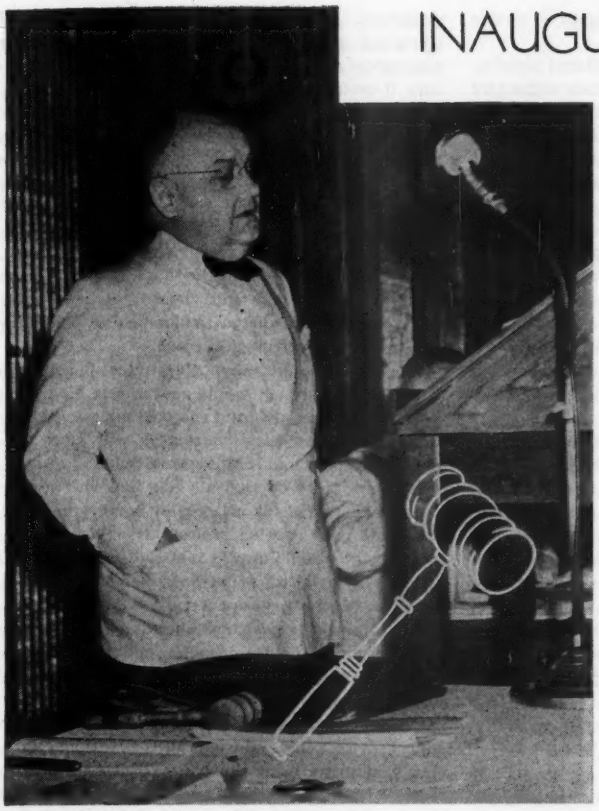
A typical experiment showed that solutions that had stood at room temperature and at refrigerator temperature for eight days apparently had the same potency as a freshly prepared solution. A solution that had been stored in the incubator (37° C.) for the same period was devoid of activity.

From these results Dr. Kirby concludes that "it would certainly seem safe, in temperate climates, to mix two or three days' supply, either for intermittent intramuscular injection or for continuous intravenous drip, and leave it at the patient's bedside." This will be of considerable importance, he points out, when penicillin is available to the general practitioner for administration in the home.



**PENICILLIN'S EFFECT** on staphylococcus aureus is shown in these electron micrographs taken at the RCA Laboratories. Bacteria from inhibited and uninhibited areas of an agar plate during a penicillin assay were used. Under the electron microscope the normal bacteria appeared as shown on the left; the bacteria from the area inhibited by penicillin have either disappeared or have been transformed to the small wrinkled bodies observed in the micrograph on the right (magnification of about 15,000 diameters as shown). This first test of its kind was a rough one intended primarily to explore the possibilities of using the electron microscope in pharmaceutical laboratories producing penicillin. The electron microscope utilizes a beam of electrons, instead of light, which is directed through a series of "magnetic lenses" to show microscopic details far beyond the reach of the most powerful optical microscopes.

# INAUGURAL ADDRESS



by GEORGE A. MOULTON

ACCEPTING THE GAVEL AT THE 92ND MEETING OF THE A. PH. A., THE NEW PRESIDENT MAKES TIMELY PROPOSALS FOR FURTHER INCREASE OF ASSOCIATION SERVICES

I AM wholeheartedly in accord with the program for action reported by the Committee on Policy and Planning and consider myself fortunate to enter office with such a definite statement of policy. It is the result of long hours of painstaking study. However, in addition to the matters presented by the Policy and Planning Committee and to those already instituted by the Council, I would like you to consider the following problems.

## Informing Pharmacists of A. Ph. A. Services

It is widely known that the most frequent question put to those working in the field for the ASSOCIATION is, "What does the AMERICAN PHARMACEUTICAL ASSOCIATION do for me?" That is a challenge which must no longer be overlooked.

I do not presume to know all about such services, but someone should gather this material for proper dissemination to members of the profession of American pharmacy. Such a brochure, covering the accomplishments within the scope of the established objectives and limited to the last two decades, would provide a conclusive answer to this question that has plagued loyal members seeking recruits.

Inasmuch as the Committee on Policy and Planning necessarily have this material at hand, *I recommend* that this committee be requested and empowered to prepare for publication as soon as possible a pamphlet containing this subject matter in a form attractive to the average pharmacist.

## Memberships, State and National

The AMERICAN PHARMACEUTICAL ASSOCIATION can profitably continue its interest in helping to organize strong state associations which in turn will reflect an increased interest in the AMERICAN PHARMACEUTICAL ASSOCIATION membership.

A recent survey conducted with great attention to accuracy by my office shows some startling figures with relation to membership in state and national

associations. I will briefly comment on two phases of the report.

Approximately 41.5% of active registered pharmacists of this country are members of their respective state associations. On the premise that two-thirds of the membership of the AMERICAN PHARMACEUTICAL ASSOCIATION are registered pharmacists, the percentage of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION compared with the total number of registered pharmacists is less than 6%.

When compared with the membership of the American Medical Association, which approximates 66⅔% of their possible membership (about 50% of their membership are Fellows of the Association), it is obvious that the problem of membership in our own ASSOCIATION still deserves urgent attention and prompt action other than the procedures in use up to this time.

*I recommend* that the special committee appointed by the Council to study memberships, dues and publications continue their studies and prepare at a near date a definite program to bring the membership total of the national ASSOCIATION more into line with the state associations' membership.

I suggest that this program, when developed by the Committee, be placed before the next session of the Secretaries' Conference for their cooperative study, to the end that an acceptable national program on membership may be presented soon to the Council for prompt action.

## Association Income

The security of this organization lies in progress. The Committee you set up to plan progress for the ASSOCIATION reports the need of proper finances to support the plans for progress. No national organization that provides adequate service to members functions on membership dues alone. For the most part, association budgets are maintained by earnings of its publications.

One national professional association, whose financial report I have recently studied, shows income from membership dues of approximately $65,000 and salaries of $275,000. The budget is balanced by gross earnings from publications and periodicals of approximately $2,700,000, one half of which was derived from advertisers in these publications.

*I recommend* that the Committee on Publications of the Council restudy the present policy governing advertising contracts of our publications with a view to liberalizing the policy now in effect and thus make possible an increase in advertising income. The Committee's recommendations should be presented to the Council at its November meeting.

It has long been the plaint of retail pharmacists that new employee graduates were inadequately trained for the practical everyday duties of the drugstore. The literature outlining pharmaceutical education stresses the varied fields open to the graduate of a college of pharmacy. From this literature it would seem that the present syllabus attempts, in four years, to prepare each student for all these possible fields. This tends to result in a training so thinly spread that it becomes inadequate for any one of the fields enumerated, and results in the criticism mentioned.

It would appear worth while to study the advisability of establishing a first year of basic courses, following which, during the next three or more years, the student would choose courses leading more especially to the particular field of pharmacy best adapted to the given student.

Under such a curriculum, the student planning to enter retail pharmacy would concentrate his studies in that direction, deleting subjects nonessential for him and adding such courses as will more adequately prepare him for his special field.

This flexibility of curricula is in line with modern academic practice in colleges of engineering, law, dentistry and the other professions. Some colleges of pharmacy would appear better fitted than others in clinical facilities, or perhaps better adapted in faculties to offer certain curricula. This would undoubtedly help to solve a competitive condition that now exists to some degree among colleges and would rationally turn out more capable graduates in all fields.

*I recommend* that the AMERICAN PHARMACEUTICAL ASSOCIATION representatives on the National Syllabus Committee bring this point of view to the very early attention of the Committee, which is now engaged in revising the pharmaceutical syllabus. This matter is more urgent now than ever, as we are about to enter the postwar period of education with its manifold problems.

Inasmuch as the AMERICAN PHARMACEUTICAL ASSOCIATION covers in its interests and services all phases of pharmaceutical practice for which the student may be trained, it is pleasing to note our increasing membership from the student body. This trend merits our sincere continued support and our commendation of the excellent work done by Dean Ernest Little and his Committee.

## Pharmacy International

If there is one thing the present war has taught us, it is the fact that no nation, nor any nationwide organization, can seclude itself within its own boundaries.

Evidence now tends to point to greatly increased interest in American drug manufacture, research, education, and methods of distribution on the part of those living outside continental United States. Some 14,000 pharmacists, mostly recent graduates, are scattered over the five continents and the seven

seas. Their comparison of American pharmacy with that which they observe in foreign lands can easily bring about a demand for changes in present American practices.

On the other hand, every G. I. Joe and Jane, some eleven million strong in the armed forces, have been direct ambassadors of American pharmacy to the people of other countries. Where the lay public of foreign countries has been made aware of American pharmacy through military medical service, the way is undoubtedly open for the AMERICAN PHARMACEUTICAL ASSOCIATION to initiate the good neighbor policy in the field of health services as related to pharmacy.

*I recommend* that the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION set up a special committee to begin at once the investigation of what is feasible to try to accomplish this year, in this widening field of international cooperation, for pharmacy.

## Stepping Up the A. Ph. A. Assembly Line

With the increased tempo of everyday living, procedures adopted ten years ago to put into action the program initiated by the will of the membership are no longer adequate. The mechanism of waging the present war has illustrated the value of cutting down the time loss between the decision to act and the action itself in full momentum.

A study of a chart showing the number of years it has taken some of the ASSOCIATION projects to come into action is eloquent testimony of this time-loss factor in ASSOCIATION work. One example is the timing of the present address, where recommendations for ASSOCIATION activities are annually presented by your highest elected officer *after* all annual legislative sessions have adjourned, and thus no constitutional action may be taken. A second example is the time lost at annual sessions by the duplicated effort of the General Sessions and the House of Delegates, the legislative body. Both of these bodies have essential usefulness. When they meet only once a year the need to restrict their agendas, each to its respective function, has been the subject of recommendations for years by your presidents and others. Some day you will attend to this matter. Is there any reason why we cannot make an effective start to do this now?

*I recommend* that the Committee on Policy and Planning study the constitutional form of organization of the General Sessions and of the House of Delegates to find the quickest satisfactory solution to this overlapping action of the two Assemblies and to strengthen further the legislative prerogatives of the House of Delegates. Their findings should be made available to the Committee on Constitution and Bylaws in ample time for definite action at the next annual meeting.

## Statistical and Legal Service

It has long been my experience that state association officers have been unable to find an adequate source of information necessary to prepare properly their pharmaceutical legislative programs. This has resulted in an heterogeneous group of state pharmacy laws.

In fairness, it should be mentioned that for the past twenty-five or more years the leadership directed to this problem by the National Association of Boards of Pharmacy has been most helpful in providing some uniformity to studies for legislative action. However, during the last decade, laws affecting the distribution and compounding of drugs have become increasingly Federalized.

To provide a central source of statistics from which absolutely dependable data, legal and historical, within the field of pharmacy may be secured, and to provide a uniformity in the interpretation of such information, *I recommend*, that the Council study the feasibility of establishing a legal and statistical department with definite personnel to direct it.

This recommendation will give added meaning to the words used in the various objectives set forth in the Constitution and Bylaws that seek to uphold the standards of education and of practice of pharmacy and to restrict the dispensing and the sale of medicines to educated pharmacists—all of which today is controlled by public statute.

I scarcely need to point out that the proper evaluation of pharmacy statistics to Federal agencies is most helpful to the continued progress of American pharmacy.

## Achievement, Past and Future

I have tried to present the more pressing needs, not only of the AMERICAN PHARMACEUTICAL ASSOCIATION, but also of the people whom it serves. The history of the services performed by the AMERICAN PHARMACEUTICAL ASSOCIATION over nearly one hundred years will stand the scrutiny of the most exacting or critical student.

At this time there are many inverted appraisals of pharmacy, its organizations and personnel. The greatest need at this moment is for those who seek to be leaders of pharmacy to train their spyglasses right-end-to upon the individual members of the ASSOCIATION and upon the thousands of other pharmacists who are not yet members—and, vice versa, for every pharmacist to be very sure he is looking through the proper end of his telescope when he trains it on the AMERICAN INSTITUTE OF PHARMACY.

I hope to be able during this year to bring within the vision of as many pharmacists throughout the nation as possible, in true perspective, the essential

dependence of all pharmacists upon the AMERICAN PHARMACEUTICAL ASSOCIATION.

This same obligation and opportunity should be a part of the daily life of those who are leaders of organized pharmacy of each state. Cooperation between national and state leadership is the prerequisite to any definite progress we can make. Merely to stand still is to go backward. As I know the state groups, their part of this union will not stand still.

We are about to enter another cycle of business due to the war emergency. This postwar conversion back to ordinary living schedules is the cause of much present-day concern—some optimistic, some pessimistic. I am intensely optimistic of the immediate future of pharmacy. I am not unaware of the cataloging of all that is wrong with pharmacy, for to acknowledge one's faults is the first step toward correcting them.

The cause of my optimism is my intimate knowledge of the retail pharmacist in the field. His local and state organizations were never in better condition, and he has practiced for the past three years more professional pharmacy than ever before in his history—and liked it. There is a definite face-lifting going on in retail pharmacy that will create better public opinion of the profession. It never will be one hundred per cent perfect any more than man himself has ever reached such a state of perfection.

The intimate and working relations between this ASSOCIATION and the National Association of Retail Druggists; the work of the American Foundation on Pharmaceutical Education; the vocational guidance material from the National Pharmacy Committee on Public Information; the character and ability of the officers, members of the Council, and standing committees of this ASSOCIATION, together with those who direct its affairs at the headquarters building, just simply are not conducive to failures.

## Pharmacy's Record Unsurpassed

If these facts just presented are insufficient to convert the professional worrier on "what is wrong with pharmacy" to my spirit of optimism, perhaps the following statement may add the finishing touch:

*Since the Pearl Harbor attack no single industry or profession has more completely met the requirements placed upon it by the expanding war and lend-lease needs as has pharmacy; nor has any worked with less fanfare and with fewer strikes among its workers.* When it became apparent that America would become the drug arsenal of the world, no one connected with the Federal agencies had the slightest idea that they could depend on the drug industry—as they thought they knew it—to meet the tremendous output involved. It still is one of the seven wonders for some war statisticians.

Where crude raw material was not available, research of our pharmaceutical manufacturers found dependable substitutes. Where climatic changes would affect the value of drugs, research found means to correct that. College professors became research counselors and agency administrators. College laboratory facilities were utilized to the limit to absorb the excess demand on producers' research laboratories, avoiding loss of valuable time and large outlays of money. Wholesale druggists, although badly understaffed, have done a most creditable job of the allocation of scarce commodities, assuring civilian health protection.

## Services of Retail Pharmacist

Retail pharmacists—and how I like to talk about them—they have been just wonderful. With some 14,000 less of them, long hours were spent in filling the nearly 300,000,000 prescriptions of the past year, in the increased sale of drug and sickroom supplies, in providing public health services, in service on local and state Civilian Defense Councils, in selling war bonds and stamps, in recruiting nurses —you know of all these civic activities in addition to the pharmacists' daily responsibility for the operation of their pharmacies.

It is very interesting to add together the war effort of pharmacy and study it. It would be a worthy project for our drug journals to place this record in one article before our practitioners, that they may gain new confidence and self-respect from it. Such an article, printed in suitable form for reprint framed display and placed in the show windows of 57,000 pharmacies could be called in a true sense of the words, "public information on pharmacy."

I, as a business man as well as a pharmacist, can only conclude that if each component part of a whole profession and industry can turn out such a record of unselfish service as the past three years have shown, no person in sound mind would attempt to sell the future of pharmacy short.

I hope this thought will be a stimulus to the literature of pharmacy, which at this time has an excellent opportunity to lead the thinking of pharmacy as it approaches the broad postwar problems that will require the best thought and effort pharmacy can offer.

No speaker at the concluding hour of these sessions would want to be denied the privilege of adding his sincere tribute to the life and services given so unstintingly and so effectively by Dr. Kelly to the work of this ASSOCIATION. Words are entirely inadequate to express my feeling of love for him. I am grateful he will be found at the right hand of his successor for years to come. Our debt to him can never be paid.

I would like also to express my appreciation to the hundreds of friends who by letters, wires and V-mail have so sincerely expressed their desire to cooperate with me, and to thank them publicly here for their message of confidence placed in me.

It is natural for members of the ASSOCIATION, as well as the profession and industry as a whole, to think of the presidency of the AMERICAN PHARMACEUTICAL ASSOCIATION as a position of active leadership, regardless of other interpretations of the Constitution. It is my intention to accept this responsibility in the light of what I believe the membership expects of me. You shall have my best efforts.

# Uses of ULTRAVIOLET RAYS IN PHARMACY

by A. R. DENNINGTON*

**GERMICIDAL RAYS PROVIDE THE PHARMACIST WITH NEW METHOD OF SAFEGUARDING DRUG PURITY**

SCRUPULOUS cleanliness, often to the point of aseptic conditions, has been the standard practice in the compounding of drugs for many years in every efficient laboratory, hospital and retail pharmacy. One possible source of contamination, the ambient atmosphere, has not been averted because until recently the pharmacist had no way of removing bacteria from the air.

Now, with the development of simple reliable sources of ultraviolet rays, the air can be practically cleared of bacteria and other living organisms at little cost. This invisible germicide thus provides the pharmacist with an additional safeguard against the contamination of therapeutic agents with organisms that might produce partial or complete deterioration or result in a secondary infection of the patient.

Although the practical possibilities of ultraviolet rays as a sanitizing agent in pharmacy, as in many fields, are only now being put into use, research in a number of laboratories has been in progress for years. The dramatic success of investigations started nearly a decade ago gave much of the early impetus to the use of ultraviolet rays.

Oddly enough the problem was not directly one of sanitation but of tenderizing meat. Meat packers had long depended on the naturally-occurring enzymes in animal flesh to soften the tough connective tissue through digestive action. Yet to increase the tenderness of meat one grade required time-consuming and expensive storage at safe refrigeration temperatures for five to eight weeks.

Meat experts knew that the enzymes would do their softening-up task more quickly at elevated temperatures and relatively high humidities, but molds and bacteria grew apace. Three groups of scientists, their activities centered at the Mellon Institute in Pittsburgh, were put to work on the problem. Three years later, in the annual report of the Institute, a new process was announced which tenderized meat in only three days, less than a tenth of the time formerly required.

Natural enzymes were still depended upon to make the meat more tender but they were stimulated to faster action by a storage temperature of 60° F. Everyone was asking: Why doesn't the meat spoil? The answer was: Ultraviolet rays produced by controlled Sterilamp irradiation.

Since that time ultraviolet ray installations have enabled at least fifteen meat distributors quickly and economically to supply meat that is more tender than the freshly killed animal.

Meanwhile other scientists were investigating the bacteria-banishing power of the invisible rays. As usual after the first enthusiasms, it was found

* From the Westinghouse Lamp Division, Bloomfield, N. J.

that the new sanitizing agent had important limitations. The rays cannot penetrate deeply and organisms are easily shielded from their power by foreign material. For example, heavy contamination with dust particles hinders the irradiation of air; dirt or cosmetics on a solid such as glassware reduces the sterilizing action; suspended material in a liquid usually places the efficacy of ultraviolet irradiation in doubt.

Nevertheless, within these limitations, ultraviolet rays are providing a new approach to difficult problems of sanitation. Operating rooms in many leading hospitals are now blanketed with the protective rays. Scientific evidence has been presented to show that the old problem of cross infection in contagious wards can likewise be prevented. The number of reports showing decreased absenteeism in business offices after installation of an adequate number of ultraviolet lamps under proper conditions is impressive.

It is natural that a development of this kind should be adapted to the needs of the pharmaceutical profession as an aid to cleanliness and the prevention of contamination.

FIG. 1—A table model ultraviolet lamp provides a sanitized area in the prescription laboratory to reduce the danger of contamination when drugs are compounded.

Research has perfected and increased the efficiency of ultraviolet lamps to the point where they can now be economically installed wherever pharmaceuticals are prepared—in the retail pharmacy, the hospital dispensary or the commercial laboratory.

## Chain of Protection

Ultraviolet rays can, and have, provided a complete chain of protection against air-borne bacteria in the distribution process: They are used in the large laboratory where drugs are manufactured, in the glass plant where prescription bottles are manufactured aseptically, and in the prescription room where the drugs are compounded for the patient. Installations are still relatively few and on an empirical basis, but continued investigations indicate that more extensive use of ultraviolet lamps in pharmaceutical operations is justified.

Work tables in retail pharmacies and hospital dispensaries should be protected by ultraviolet radiation, as exposure of pharmaceutical products to air-borne organisms at this point may largely neutralize efforts of the pharmaceutical manufacturer to produce and distribute germ-free drugs. In the larger pharmacies the arrangement of ultraviolet generators may be essentially the same as for the protection of vaccines, sutures and other products during packaging operations in the manufacturing laboratory described below. But for the great majority of pharmacies a small inexpensive unit may be attached to a shelf or bracket over the prescription counter. An adjustable shield fitting closely around the ultraviolet lamp is provided to direct the radiation on the drugs being compounded and to prevent radiation reaching the eyes of the pharmacist.

A more elaborate fixture about the size of an ordinary table lamp (Fig. 1) is also available[1] at small cost. About 2000 of these units have already been distributed to retail pharmacists.

The same company that distributes the table model lamps also manufactures prescription bottles[2] that are cooled and capped in air irradiated with the bactericidal rays. Thus the bottles remain in a sanitized condition until opened by the pharmacist. The prescription can then be

[1] A type of Sterilamp distributed by Brockway Glass Company, Brockway, Pa.
[2] Sold under the trade name of Sani-Glas.

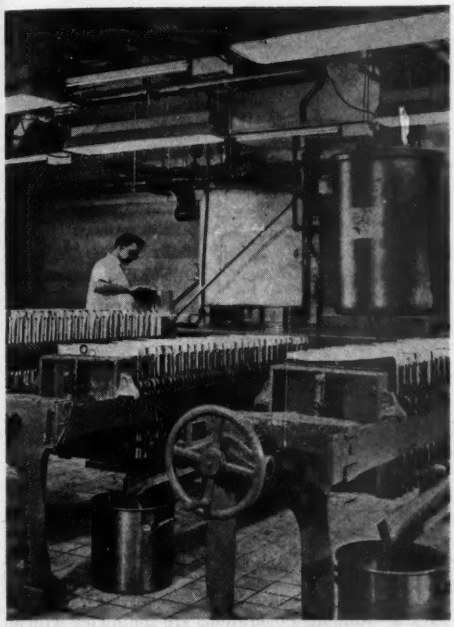


FIG. 2—Ultraviolet lamps are spaced between fluorescent lighting fixtures to give both uniform bactericidal radiation and illumination in a filter room of E. R. Squibb and Sons.

compounded under the ultraviolet lamp, bottled in the previously sanitized container, and delivered to the patient practically free of air-borne bacteria.

Ultraviolet rays are not a substitute for cleanliness but they do provide one more tool which helps the pharmacist prepare medicinal agents of maximum purity. Yet, the purity of the products dispensed remains in large measure dependent on the standards maintained in the large laboratories which supply the pharmacist with his prescription ingredients and other drugs. Here, too, ultraviolet radiation is being adopted as an additional protection against contamination.

During the past year there has been rather widespread and rapid increase in the number of ultraviolet lamps in pharmaceutical laboratories, but this increase was preceded by a period of more than a year when large manufacturers worked with and tested various ultraviolet generators to determine their effectiveness. These tests indicated beyond question that bactericidal radiation provided a safeguard against bacterial contamination of products and cross infection of test animals which more than justified the extensive use of ultraviolet generating units in practically every part of the manufacturing and biological laboratories.

As a result, the number and variety of bactericidal ultraviolet applications has been increased until several pharmaceutical establishments now have from 100 to 200 ultraviolet lamps, sold under the name Sterilamp, in continuous service. These lamps provide a relatively high percentage of output in the region of 2537 Angstrom units which is as close to the most effective bactericidal wave length of 2600 Angstroms as can be obtained practically. More than 80% of the total ultraviolet radiation provided by the lamp is at approximately 2537 Angstrom units.

## Irradiation of Animal Rooms

Some of the applications of these ultraviolet generators in the laboratories of E. R. Squibb & Sons are of special interest. General irradiation of the rooms where animals for inoculation tests are kept has been effective in reducing cross infection among animals in different cages. Small animals, such as mice, rats, guinea pigs and rabbits, are usually kept in metal cages which have bars or gratings at the front and openings in the sides for ventilation and light. Where the construction prevents direct passage of air from cage to cage, the path of possible air-borne infection is out into the room where there is bactericidal radiation. These rays kill or weaken the bacteria or virus, greatly reducing the danger of infection. Studies of inoculations can thus be made under better controlled conditions than without ultraviolet radiation in the room.

Workers in an irradiated animal room may be protected by eye shields, preferably supplemented by eye shades or caps with visors. This prevents direct or reflected radiations from reaching the eyes and causing temporary but painful conjunctivitis. The eyes of animals, being ordinarily more exposed to sunlight than the eyes of humans, are not easily affected by bactericidal radiation, and in case of overexposure recovery is rapid.

The continuous reduction of the number of living organisms in the air counteracts to a great extent the number which is being added by the exhalations of the animals and the disturbance of litter in the cages, thus preventing the development of a large population of microorganisms in the air.

The larger animals such as horses and cattle, which are used for the production of serums, antitoxins and smallpox vaccine, must be kept under the most sanitary conditions possible to assure their continued health and freedom from even transient infection. In addition to having the most modern equipment and maintaining it in scrupulously clean condition, ultraviolet lamps are therefore installed on the ceiling over the animals to sanitize the air. Continuous irradiation of the air, walls and floor in this section of the building provides a more sanitary environment for the animals than previously has been obtainable. Irradiation of the air gives sanitary control to an element which, until the present, could not be given purifying treatment comparable to that provided for food and water.

## Laboratory Irradiation

Many tests made by Dr. Harvey C. Rentschler, director of research for the Westinghouse Lamp Division, indicate that most pathogenic organisms are killed by about half the quantity of bactericidal radiation required for killing *B. subtilis* spores. For example, *Eberthella typhosa* requires 20 to 30 clicks of the Rentschler meter and *B. anthracis* requires 30 to 50 clicks for about 95% kill, while *B. subtilis* spores require 50 to 65 clicks. The clicks of a Rentschler meter are a means of measuring the ultraviolet radiation, each click representing 220 microwatt seconds per square centimeter. The apparatus is essentially a highly responsive photoelectric cell connected with a device that sends electrical impulses to a counting device which gives an audible click as each unit is registered.

In one well-known pharmaceutical laboratory each step in the preparation of blood plasma is protected by ultraviolet rays, beginning with the refrigerated receiving room where the bottled blood is received and stored until it can be processed. After the blood has been put through a centrifuge to remove the solid matter, the plasma is filtered twice. During the filtering process, the plasma is exposed for an appreciable time to the air of the room. It is very important to have the air free from organisms, hence ultraviolet radiation from twelve lamps is provided. These lamps are mounted at the same height as the fluorescent lighting fixtures and spaced between them to give uniformity of radiation as well as of illumination. This arrangement also prevents either the lighting units or the ultraviolet lamps being shaded by or interfering with the other (Fig. 2).

**FIG. 3—Ampuling operations are conducted with an increased measure of protection under ultraviolet rays as shown in this photograph taken in a laboratory of the George Breon Company.**

The radiation is directed into the lower part of the room where the need of protection is greatest. It has been the experience in pharmaceutical laboratories that with ultraviolet radiation in the working areas, the precautions usually taken to prevent contamination of the products yield more positive results than were obtainable without air sanitization.

In a typical laboratory where work may be performed at a bench or at any other part of the room, general radiation should be provided. It should be noted that tinted or dark-colored glasses or shields are not required for the workers as any ordinary clear glass is opaque to the ultraviolet radiation and hence affords complete protection to the eyes. Most transparent plastic shields give the protection required although a few plastics have sufficient transmission of ultraviolet to render them unsuitable as eye protectors.

Areas in which vaccines or other products are sealed aseptically in glass tubes must be carefully

protected from air-borne organisms. Usually the ampul filling and sealing is done behind a glass shield which allows the worker to see the operation but which deflects the breath away from the work (Fig. 3). An increased measure of safety to the product may be obtained by placing ultraviolet lamps back of the glass shield and about two feet above the table top. The bactericidal radiations are of sufficient intensity at the point where the sealing is done to kill or inactivate most microorganisms within a few seconds. There is small chance that any living organism will survive the barrage of ultraviolet rays long enough to float into an ampul.

Sutures are handled in essentially the same way as ampuls and may be protected by ultraviolet radiation in the same manner. General radiation in the suture processing rooms aids in maintaining aseptic conditions and assuring a sterile product.

In transferring organisms from one culture medium to another, there is always the chance that air-borne bacteria may contaminate the new culture. Where this work is done at tables protected by glass shields, it is advisable to install ultraviolet generators back of the shields as suggested for ampul protection. If no shields are used, it is usually necessary to install ultraviolet lamps on the ceiling of the room and to depend upon general irradiation to prevent accidental infection of cultures. In either type of installation there is no danger of killing or inactivating the culture being transferred because the ultraviolet rays have practically no penetration into the cultures or media. Thus, only a minute surface layer of organisms is affected by the rays but organisms floating in the air are fully exposed to the radiation and are killed.

Practically all the producers of penicillin are installing Sterilamps in the new plants that are being constructed to provide an adequate supply of this important new drug. General radiation is provided during all processes where the air of the room may enter the flasks or tanks containing the cultures. The object is to protect the cultures from air-borne contamination.

The applications of germicidal ultraviolet radiation in pharmaceutical laboratories and retail and hospital pharmacies which have been described are general in character. Many special applications will be found for the radiation method of sanitizing air in pharmaceutical operations that will permit standards of purity of products exceeding those which have been possible without this safeguard.

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Lilly Presents

# DIGEST OF OPERATING STATEMENTS

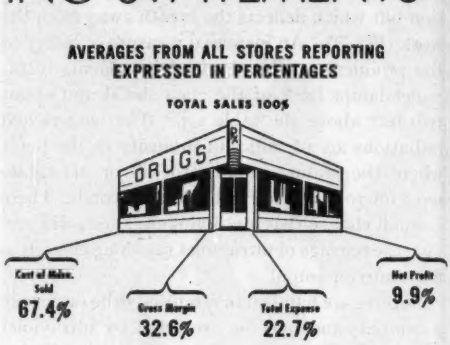
OPERATING statements of 1244 retail pharmacies for 1943 are analyzed in the twelfth annual edition of the "Lilly Digest", which is just off the press and available to pharmacists on request.

Despite personnel and merchandise shortages and other wartime difficulties, 1943 was a year of record sales and profits for the pharmacist. But as the study points out, when the higher taxes necessary to help pay the cost of the war are deducted from these profits the amount remaining will be little different from former years.

Statistics on the group of pharmacies reporting show that the percentage of pharmacies making 5% profits or more before taxes increased from 32% to 74% during the period from 1932 to 1943. At the same time the number of pharmacies operating at a loss dropped from 34% to 6%. In retail pharmacy it does not appear that this increase in sales and profit is due to inflationary price increases. The two most important factors cited by the Lilly study are (1) the decrease in the number of pharmacies, which means that available sales are shared by a smaller number of proprietors and (2) the widespread general increase in public purchasing power that has been apparent since 1939.

The average prescription price charged by the pharmacies participating in the 1943 Lilly survey was $1.05. This is somewhat higher than the average reported in 1939, which may largely reflect increased prescribing of new medications that are often more expensive as well as more effective. It is significant to note that the unit price for prescriptions is much higher than for other purchases in a pharmacy and because of the fee for compounding, the gross margin is likewise much higher than the average margin on other sales.

**AVERAGES FROM ALL STORES REPORTING EXPRESSED IN PERCENTAGES**




**RATIO OF PRESCRIPTION SALES DOLLAR TO DOLLAR INVESTED IN PRESCRIPTION STOCK**

In wartime, as in previous years, the Lilly study reveals that efforts to build larger prescription volume will reward the pharmacist with substantially increased total store profits. Furthermore, increased prescription practice will yield a much greater return per dollar invested in prescription stock. The greater turnover also reduces risk of loss due to deterioration.

The "Lilly Digest" sounds a timely warning against speculative purchases of drugstore stock as a form of investment for surplus money. Reconversion will bring a return of peacetime packaging methods and the introduction of improved products that have been held back by the war. These factors make it essential that pharmacists buy in accordance with current needs to avoid loss later on.

Young pharmacists often ask: Where is the best place to open a pharmacy? According to the Lilly analysis of 1244 operating statements, opportunities for success appear to be fairly evenly distributed among cities of different sizes although conditions were somewhat more favorable on the average in communities of less than 5000 population.

The size of the pharmacy appears to be less important than the location, as the percentage of net profit does not vary greatly on the average

among pharmacies having different sales volumes. But chances of success in pharmacies doing less than $10,000 per year appear slim, judging from the 1943 statements, for two out of five such pharmacies operated at a loss compared with a general average of one out of sixteen operating at a loss.

In addition to tables of costs for pharmacies arranged according to sales volume and population of city, the new "Lilly Digest" contains a table of "goal" figures—average costs of unusually successful pharmacies, conducted under normal conditions, toward which the alert pharmacist can aim his own operations.

Pharmacists have reported that this survey has been helpful in providing an annual yardstick against which to measure their own practice. The 40-page 1943 "Lilly Digest" is available without charge from Eli Lilly and Company, Indianapolis 6, Indiana.

## DISCOLORS GRAY HAIR

*Can anything be added or deleted from the following preparation for the hair (without impairing the therapeutic effect) which will lessen the tendency to discolor gray or white hair?*

| | |
|---|---|
| *Resorcin* | gr. xxx |
| *Salicylic acid* | gr. xxx |
| *Menthol* | gr. xv |
| *Spirit of camphor* | ℥i |
| *Solution of coal tar* | ℥iv |
| *Lanolin* | ℥iv |
| *Olive oil* | ℥iii |
| *Crude oil, q. s. ad* | ℥vi |

.—*R. B., Pennsylvania*

Both the solution of coal tar and the resorcin in this preparation will discolor gray or white hair.

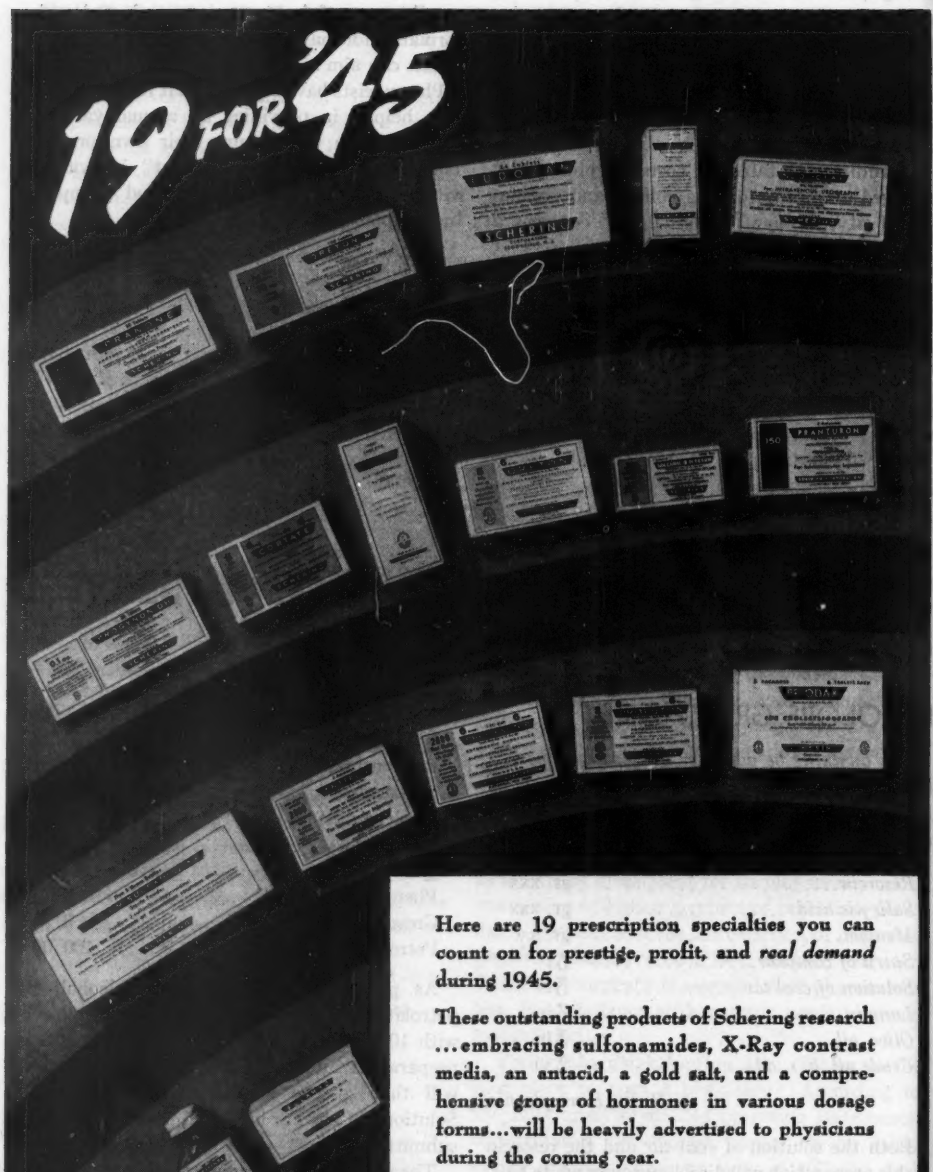
We suggest that a solution of the stainless synthetic tar developed at the University of Pittsburgh School of Medicine be used to represent Solution of Coal Tar. The formula contains the active ingredients of coal tar in the correct proportion and can be used in the same amounts as the crude product:

| | | |
|---|---|---|
| Anthracene | | 1.10 |
| Naphthalene | | 10.90 |
| Phenanthrene | | 4.00 |
| Carbazole | | 2.30 |
| Picolene | | |
| Pyridine | | |
| Quinolene, | *aa* | 0.58 |
| Phenol | | 0.70 |
| Cresol | | 0.75 |
| Petrolatum | | 100.00 |

As petrolatum is insoluble in alcohol, the petrolatum in this formula had best be replaced with 100 cc. of alcohol. One part of the above preparation diluted with four parts of alcohol will then give a solution approximating the Solution of Coal Tar indicated in the prescription submitted.

The resorcin can be replaced with a like amount of resorcin monoacetate, which will not stain light hair.

As an additional comment, we should like to point out that both the menthol and camphor content seem higher than is ordinarily desirable. It would appear advisable to reduce the quantities specified by at least 50%. Resorcin and the




Here are 19 prescription specialties you can count on for prestige, profit, and *real demand* during 1945.

These outstanding products of Schering research ...embracing sulfonamides, X-Ray contrast media, an antacid, a gold salt, and a comprehensive group of hormones in various dosage forms...will be heavily advertised to physicians during the coming year.

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SCHERING CORPORATION • Bloomfield, N. J.

tar compound will produce sufficient stimulation without resorting to camphor and menthol, which might even tend to produce some irritation.

## AVOIDING PRECIPITATION

*We have been having trouble with the following prescription, a favorite of one of our medical clients:*

| | |
|---|---|
| *Cocaine alkaloid, 1%* | ℥ i |
| *Adrenalin Inhalant* | ℥ i |
| *Menthol* | |
| *Camphor* | *aa* gr. i |
| *Liquid Albolene, q. s. ad* | ℥ i |

*By warming the cocaine alkaloid in peanut or olive oil, adding the camphor and menthol previously dissolved in liquid petrolatum, then incorporating the balance of the oil, a clear solution results. But upon addition of the Adrenalin Inhalant the solution throws down a flocculent precipitate. This isn't elegant pharmacy, and I should like to have your comments.—R. B., Pennsylvania.*

Adrenalin (epinephrine) is insoluble in liquid petrolatum or Albolene and is therefore thrown out of solution when added to the other ingredients. Since all of the ingredients of the prescription are soluble in vegetable oils, it would be logical to obtain the prescriber's permission to substitute olive oil or other light vegetable oil to replace the liquid Albolene.

## METHENAMINE AS HEAT SOURCE

*"Is methenamine a source of heat in the practice of pharmacy?" Although the drug is combustible, it seems to me the logical answer is "no." My questioner says I am wrong. I would appreciate your comment.—A. S., New York.*

Methenamine does burn with a clear, smokeless flame that makes it useful occasionally in an emergency. Physicians, particularly, may burn a tablet to sterilize a hypodermic needle in a test tube full of water or to test for albumen in urine. As it is rarely used for such purposes by the pharmacist one would hardly think of it as a source of heat in pharmacy.

## MORE BRANCHES ORGANIZED

Despite the drastically reduced college enrollments, 986 pharmacy students were active members of student branches of the AMERICAN PHARMACEUTICAL ASSOCIATION on August 1, Dr. Ernest Little, chairman of the Committee on Local and Student Branches reported to the annual meeting of the A. PH. A.

New student branches organized during the ASSOCIATION year are located at the University of Buffalo, Long Island University, Philadelphia College of Pharmacy and Science and St. Louis College of Pharmacy. Northern California and Northwestern Ohio established new local branches. There are now 15 local branches and 34 student branches.

To strengthen the A.PH.A. branches and give aid to the professional program of their members, Dr. Little urged in his report to the ASSOCIATION that a full-time employee be added to the staff at the AMERICAN INSTITUTE OF PHARMACY to carry on this work.

Other projects proposed were the establishment of a publication for student branches and the organization of student branches on a district basis. A successful district organization has already been founded in District 4.

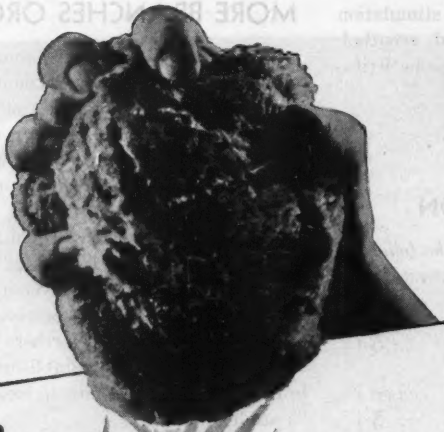
## E. V. ZOELLER DIES AT 87

Dr. Edward V. Zoeller, 87, a corner pharmacist who contributed much to the advancement of his profession, died at his home in Tarboro, N. C., on October 22.

The year after he graduated from the New York College of Pharmacy he joined the AMERICAN PHARMACEUTICAL ASSOCIATION and later became a life member. In 1929 Dr. Zoeller was named honorary president of the ASSOCIATION in recognition of his services to pharmacy.

He conducted a retail pharmacy in North Carolina for the past sixty-seven years. In 1880 he helped found the North Carolina Pharmaceutical Association and served continuously on the State Board of Pharmacy since 1892.

Dr. Zoeller was a delegate to the 7th International Pharmaceutical Congress and was on the committee which compiled the first National Formulary. Many other pharmaceutical developments have been aided by his work.



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| | | Wholesaler's Price to Dealer |
|---|---|---|
| **TABLETS** | | |
| Bottles of 25 | per bottle | $0.75 |
| Bottles of 100 | per bottle | 2.50 |
| Bottles of 500 | per bottle | 11.00 |
| **AMPULS OF 1 cc.** | | |
| Boxes of 5 | per box | .88 |
| Boxes of 25 | per box | 3.63 |
| Boxes of 100 | per box | 13.13 |
| **AMPULS OF 2 cc.** | | |
| Boxes of 10 | per box | 1.63 |
| Boxes of 25 | per box | 3.75 |
| Boxes of 100 | per box | 13.75 |
| **SUPPOSITORIES** | | |
| Boxes of 5 | per box | 1.20 |
| Boxes of 25 | per box | 5.50 |

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# JOURNAL OF THE
# AMERICAN PHARMACEUTICAL ASSOCIATION

## PRACTICAL PHARMACY EDITION

*Editor*

GLENN SONNEDECKER

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## INDEX TO VOLUME V

INDEX TO SUBJECTS

INDEX TO AUTHORS

---

JANUARY TO DECEMBER, 1944

50813

# INDEX TO SUBJECTS


A

**Acetylsalicylic acid** and sodium bicarbonate incompatibility, 315
**Acne,** successful treatment reported, 182
**Alcohol,** rub for furunculosis, 151
  Rubbing compound, 45
  Tax drawback forms supplied by A. Ph. A., 200
  Tax law, new, 97
  Toxicity of, 207
**Aluminum hydroxide gel,** 216
**American Pharmaceutical Association**
  Annual Meeting (92nd), Address of the president, Ivor Griffith, 303; Cleveland named as meeting place, 203; Highlights, 234; Nomination of 1945-46 officers, 270; Problems facing delegates, 198; Program, 236; Recommendations of the president, 314; Report, 269; Inaugural address of president, 333
  Branch organizations
    Reports of 24, 55, 82, 119, 156, 194, 227, 279; Rutgers student exhibit, 181; new plans, 345
  Centennial celebration planned, 271
  Conference of State Pharmaceutical Association Secretaries, 289
  Council meeting in Washington, April, 1943, 147
  Election of officers for 1944-1945, 37
  Membership largest in history, 72
  Official roster, 1943-44, 190
  Pan-American pharmacy congress proposed, 271
**Aminophylline,** caution for intravenous use, 43
**Ammoniated mercury** in cold cream base, 316
**Analgesic action** of drugs in treatment of common cold, 29
**Antibiotic** discovered in common alga, 184
**Anticoagulant,** dicumarol useful as, 122
**Antimalarial,** atabrine equals quinine, 290
**Antipyretic,** Japanese, 113
**Argyrol** incompatibility in nasal solution, 71
**Army Medical Administrative Corps** plan for pharmacists, 69
**Arny, H. V.,** dies, 80
**Arsenic trioxide,** dispensing in soluble form, 214
**Asthma mixture,** 145
**Atabrine** equals quinine as antimalarial, 290
**Australian pharmacy** bill, 146

B

**Balsam Peru** ointment incompatibility, 45
**Barbiturates** and diphenylhydantoin, 168
**Bentonite,** nature and uses, 249
**Benzoin inhalant** formula, 31
**Benzyl benzoate lotion** for scabies, 153
**Bismuth salt** of heptadiene carboxylic acid, 214
**Blood,** red cell paste, therapeutic prospects, 301
  Red cell powder speeds wound healing, 10
**British health plan,** 79
  Postwar planning, 225
**Bromide** poisoning still too common, 277
  Sedative, 170
**Burns,** cellophane dressing, 278
  Chemical, treated with buffer, 32
  Infection prevention aided by sulfanilamide ointment, 44
  Shock treated with sodium lactate solution, 44

C

**Calamine lotion,** improved application, 14
**Calgon,** 216
**Cancer control,** role of pharmacists, 67
**Caries control** by sodium fluoride, 214
**Cellophane dressing** in burn treatment, 278
**Cellulose acetate phthalate** as enteric coating, 154
**Ceresin** for increasing physical hardness of cream, 12
**Chenopodium,** dispensing oil of in capsules, 11
**Chloral hydrate,** 170
**Chlorellin,** antibiotic discovered in common alga, 184
**Chinese** ancient pharmacy, giant teeth discovered, 252
  Use of insects in pharmacy, 218
**Cinchona** regulations summarized, 291
**Cleaning fluid** for glassware, 212
**Coal tar paste** improved, 276
**Coal tar,** discolors hair, 343
**Cod liver oil,** in burn treatment, 183
**Codeine sulfate,** incompatibility, 146
**Cold medications,** 28
  Vaccine effectiveness questioned, 78
**Cologne water** formula, 213
**Cosmetics** and dermatitis, 74
**Cough medicine** formula, 281
**Cream for dry skin,** 146
  Protective for industrial workers, 248
**Cream of tartar** as surgical dusting powder, 33
**Creosote carbonate,** formula for stable emulsion, 72
  Incompatibility with water-containing ingredients, 11

D

**Decolorizing,** prescription incompatibility, 215
**Demerol** placed under narcotic laws, 245
**Denture cleaner** formula, 70
**Deodorant,** camphor, oil for masking, 319
  For onion odor, 212
**Dermatitis** and cosmetics, 74
**Dermatosis control** measures, 155
**Dermatotherapy** formulas, 94
**Diasone,** 77, 328
**Dicumarol,** useful as anticoagulant, 122
**Digitalis** detoxified by heparin, 56
  Tends to cause thrombosis, 292
**Diphenylhydantoin** and barbiturates, 168
**Directory, pharmaceutical,** 187
  A. Ph. A. local and student branches, 193
  Allied professional societies, 189
  Colleges of pharmacy, 188
  National associations, 188
  Official roster, 1943-44, 190
  Principal publications, 189
  State associations, 188
  State boards of pharmacy, 190
**Douche powder,** color uniformity, 114
**Drug supplies,** outlook for hospitals, 297
**Druggist's Digest,** 43, 77, 153, 182, 221, 275
**Drug-buying survey** in Milwaukee, 277
**Drugstore rules,** 1854, 79
**Dusting powder,** cattle, 12
  Surgical, 33

E

**Eczema ointment** for dogs, 12
**Editorials**
  A Great Leader Passes, 322
  Asking for Competition, 323
  Better Prescription Writing, 93
  Education for What?, 284
  Interpreting Pharmacy to the Public, 128
  Latinic Dirge, 158
  Metric Millenium, 92
  On Vitamin Propaganda, 129
  Pharmacopœia and N. F., 230
  Pharmacy and Selective Service, 58
  Pharmacy Corpse?, 256
  Pharmacy Students Go to War, 26
  Pharmacy Week, 257
  Problems Facing A. Ph. A. Convention, 198
  Projects of the A. Ph. A. Council, 3
  Synthetic Quinine, 159
  Venereal Disease, 2
**Education**
  Loans to pharmacy students, government, 167
  Pharmacy curriculum changes proposed, 274, 284
**Effervescence,** due to Elixir Lactated Pepsin, 212
**Einbeck, Major Arthur,** chairman Joint Committee on Status of Pharmacists in Government Service, 64
**Electron microanalyzer** identifies virus elements, 122
**Elixir, Lactated Pepsin,** incompatibility with sodium nitrite, 212
**English,** for primary drug titles, 158
**Enteric coatings,** advantages of cellulose acetate phthalate, 154
**Ephedrine** in mineral oil, stability, 115
**Epinephrine,** insolubility in liquid petrolatum, 345
**Ergotamine tartrate** for treatment of "battle reactions," 184

F

**Fair Trade Act,** General Maximum Price Regulation amended, 223
**Fischelis, Robert P.,** heads new W. P. B. drug division, 261
**Foot powders,** astringent and medicated, 215
**Friedman, Irvin,** wins radio contest, 53
**Fungicide,** monochlormercuricarvacrol in treatment of athlete's foot, 183

G

**Gamma globulin** in measles prevention, 221
**Glassware cleaning fluid,** 212
**Grain itch, lotion** for treatment, 43
**Guava** as source of vitamin C, 122

H

**Hand cream,** non-greasy, 71

**Health plan** proposed by British group, 79
**Heparin** detoxifies digitalis, 56
And penicillin in treatment of subacute bacterial endocarditis, 44
**Hilton, S. L.,** dies, 80
**Hormone,** male, isolation and therapeutics, 174
**Hospital,** library material for pharmacists, 302
Outlook of drug supplies, 297
Supply service, 65
Pharmacists, number employed, 151
Pharmacists, Ohio objectives, 302
**Hypnotics** and sedatives, 168

I

**Inflammations,** alleviation suggestions, 107
**Influenza** research advances, 9
**Iodides,** Tincture of, action studied, 276
**Insects** in Chinese pharmacy, 218
**Isopropyl alcohol,** new uses, 38
Toxicity tested, 207
**Isotonic solutions,** rapid method for calculation, 99

J

**Japanese antipyretic,** 113
**Jones, D. F.,** dies, 80

K

**Kelly, Dr. E. F.,** plans retirement, 161; dies, 322, 324
**Kendig, H. Evert,** Remington Medalist, 1944, 172
**Kilmer award,** competition for, 149

L

**Lactose** replacement authorized, 185
Replacement of in N. F. preparations, 73
**Latin** for drug titles, 158
**Laxative,** infant, 146
**Leadbeater, Clarence C.,** dies, 296
**Lehman, R. S.,** dies, 80
**Licensing,** limitation on reciprocity, 222
**Lilly Digest,** operating statements, 343
**Liver,** solubilized, an aid in administration of thiouracil and thiourea, 276
**Lotions**
Benzyl benzoate in treatment of scabies, 153
Grain itch, formula for treatment, 43
"Shake lotions" in treatment of acne, 182

M

**Marihuana-like drugs** no aid to musical ability, 195
**Measles** prevention and gamma globulin, 221
**Meningitis,** cerebrospinal, treated with sulfadiazine, 207
**Methenamine** as heat source, 345
**Mercuriated compound** in treatment of athlete's foot, 183
**Mixture,** Oschner's, 145
**Motion picture,** on pharmacy career, 302
**Moulton, George A.,** elected A. Ph. A. President 1944–45, 37

N

**Narcotics,** conservation, 87
Demerol law, 245
Dispensing problems, 135
Tips on dispensing and prescribing, 137
**Nasal medication,** 30
**National Formulary**
Admissions approved, 164
Committee plans changes for revision, 163
Deletions approved, 163
English titles preferred, 165
Seventh edition, fourth supplement, 73
**Navy,** plans for improvement of pharmaceutical service, 273
**Nightshade** toxicity studied, 82
**Nurses, Cadet Corps,** pharmacists aid recruiting, 222

O

**Odorizer** for sick room, 316
**Ointments**
Ammoniated mercury in cold cream base, 316
Balsam Peru ointment, incompatibility, 45
Ceresin for increasing physical hardness of cream, 12
Coal tar flecks prevented, 70
Emollient for hands, 71
Endodermic, fatty, 94
Endodermic, water-soluble, 94
Epidermic, 94
Mercurous iodide ointment made more active, 111
Monochlormercuricarvacrol for athlete's foot, 184
Penicillin, 213
Perborate in vanishing cream, 316
Ringworm of toes, involving denuded lesions, 95
Ringworm of toes, involving hyperkeratotic lesions, 94
Sulfanilamide ointment and burn infection prevention, 44
Sulfathiazole vehicle, Beeler Formula No. 8, 12
Tragacanth replaced by pectin, 206
**Oschner's mixture,** for asthma, 145

P

**Paper,** conservation requested by W.P.B., 78, 275
**Paraldehyde,** hypnotic, 170
**Parasympathetic nervous system,** effect of drugs on, 286
**Paste,** coal tar, improved, 276
**Pectin** replaces tragacanth in ointments, 206
**Penicillin** and heparin in treatment of subacute bacterial endocarditis, 44
Gauze, dangers of crude product, 24
Inactivator of, 331
In syphilis treatment, 221
Indications for use, 166
Monograph developed, 106
Ointments, 213
Plan headed by pharmacists, 150
Stability of solutions, 332
Supply and distribution, 299
**Perborate,** incorporation in ointments, 316
**Petrolatum,** in burn treatment, 183
**Pharmacists,** as assistant battalion surgeons, 69
Number employed in hospitals, 151
Overseas employment with U.N.R.R.A., 296
Serve South Pacific Army hospital, 42
Service in Cleveland disaster, 327
Status in Public Health Service improved, 279
**Pharmacist's Bookshelf,** 13, 98, 139, 217
**Pharmacology,** practical uses of, 208
**Pharmacy**
Australian bill, 146
From the layman's point of view, 178
In medical care, 152
Motion picture, 302
Professional status, views on improvement, 266
War service record, 326
**Pharmacy Corps,** development of, 256
Selections made, 259
**Pharmacy Week,** aids for pharmacist participation, 262
Committee named, 120
Date set, 120
Essay contest for students announced, 223
Essay contest winner, 266
Maryland freshman wins radio contest, 53
Letter from President Roosevelt, 293
President's message, 260
Purpose of, 257
Radio address, 326
Wide observance anticipated, 292
Window display contest announced, 263
Winning windows, 1943, 46–53
**Phenothiazine,** as stock dusting powder, 12
**Phenothiazine,** equally efficient in several forms, 77
**Photographs**
A. Ph. A. Laboratory, 35
A. Ph. A. Reading Room, June-July cover
A. S. H. P. officers, 301
Anslinger, H. J., 135
Arny, H. V., 81
Bacteriostatic action of finely precipitated mercurous iodide, 111
Cancerous breast tissue, March cover
Captured Japanese quinine, April cover
Cork production, 21
Giant teeth found in Chinese pharmacy, 252
Green, Dr. Melvin W., examines preparations for Army, 36
Griffith, Ivor, 303
Hilton, S. L., 81
Influenza serum research, 9
Jones, D. F., 81
Kelly, E. F., 160, 322, 325
Kendig, H. Evert, 173
Lehman, R. S., 81
Marano, R. J., pharmacologic demonstration at Fordham College of Pharmacy, 208
Moulton, George A., president-elect, 37, 260, 273, 333
Quinine Pool, presentation of W.P.B. scroll, 246
Quinine Pool award, reproduction of, 246
Penicillin, mold growth, 20; action of, 332
Pharmacists in South Pacific, 42
Pharmacy Week window display 1943 winner, 264
Pharmacy Week winning windows, 46–53
Pharmacy Week poster, October cover
Plasma separation by centrifuging, 19
Praying mantis, 219
Robert J. Ruth trophy, 263
Roosevelt, Franklin D., 293
Testosterone propionate tested on rats, 175
Tyrothricin in mastoid therapy, 233
Ultraviolet ray uses, 338, 339, 340
Wassermann test for syphilis, 16
Weiner, Marian Nita, 266
**Poison ivy,** ineffectiveness of preventives, 17
**Postwar pharmacy plans** outlined at annual meeting, 269
**Postwar plans** discussed by British students, 225

**Potassium bitartrate as surgical dusting powder, 33**
**Powders**
Douche, color stability, 114
Foot, astringent and medicated, 215
Hydrolysis, 315
Ringworm of toes, 96
**Prescribing habits surveyed, 275**
**Prescription Information Board, 213**
**Prescription Information Service, 11, 45, 70, 113, 145, 212, 315, 343**
**Prescription pricing**
Method for determining fees, 130
Survey, 4
**Prescription writing, need for improved methods, 222**
**Pricing, prescription survey, 4**
**Productive Detailing, 94, 248**
**Professional relations, plans for improvement, 116**
Practical methods for ethical promotion, 140
**Promin, 328**
**Promizole, 328**
**Public Health Service improves status of pharmacists, 279**
**Pyrogen problems, practical aspects, 60**

Q

**Quinacrine equals quinine as antimalarial, 290**
**Quinidine, dispensed only on certified prescription, 180**
Shortage, 298
**Quinine, synthetic, 159**
**Quinine pool, scroll presented in commendation, 246**

R

**Reciprocity, limitation on, 222**
**Remington Medal awarded to H. Evert Kendig, 172**
**Research, A. PH. A. laboratory and wartime pharmacy research, 35**
Grants in pharmacy, 235
**Resins, incompatibility in specific tinctures, 72**
**Review of scientific progress in pharmacy and allied sciences in 1943, 18**
**Rutgers student branch pharmacy exhibit, 181**

S

**Scabies, benzyl benzoate lotion, 153**
**Scholarships, foundation, offered colleges, 40**
**Scientific progress in pharmacy and allied sciences 1943, digest of, 18**
**Sedatives and hypnotics, 168**
**Self service in Pharmacies, 323**
**Shampoo, neutral soapless, 114**
**Silver picrate successful in bovine vaginitis, 78**
**Social hygiene, pharmacy's role in promotion, 15**
**Sodium bicarbonate and acetylsalicylic acid incompatibility, 315**
**Sodium lactate solution in treatment of burn shock, 44**
**Sodium nitrite, incompatibility, 145**
**Sodium fluoride in caries control, 214**
**Sodium hexametaphosphate (Calgon), 216**
**State secretaries convene, 289**
**Stilbestrol, dangers of excessive dosage, 177**
**Sulfonamides**
Allergies studied, 274
Over the counter sale prosecuted, 31
Starch vehicle for local application, 76
Sensitization from oral or topical use, 185
Sodium sulfathiazole, aqueous solutions for nasal use, 45
Starch as vehicle for local application of, 76
**Sulfadiazine in treatment of "Camp Fever," 207**
**Sulfanilamide ointment for preventing burn infection, 44**
**Sulfanilamide powder in petrolatum for burns, 183**
**Sulfathiazole, compatibility in nose drops, 145**
Sulfathiazole, cream base for, 12
**Sulfated oils in treatment of acne, 182**
**Sulfur formula improvements suggested, 275**
**Syphilis treated with penicillin, 221**

T

**Testosterone, discovery and therapeutics, 174**
**Thiouracil, side effects reduced by use of liver fraction, 276**
**Tinctures**
Incompatibility of resins, 72
Iodides, action studied, 276
Sweet Orange Peel, artificial color banned, 72
**Toxicodendrol toxicity, 215**
**Tragacanth replaced by pectin in pastes and ointments, 206**
**Tuberculosis, chemistry of new compound for treatment, 77**
Recent advances against, 328
**Tyrothricin, pharmaceutical aspects, 232**

U

**U.N.R.R.A., overseas positions for pharmacists, 296**
**Ultraviolet irradiation, vaccines prepared by, 202**
Uses of in pharmacy, 337
**United States Pharmacopoeia**
Admissions and deletions proposed, 294
Changes proposed, 258
Eighth Sheet Supplement, 327
Lactose replacement authorized, 185
N.F. and, importance to pharmacist, 230
First Bound Supplement announced, 41

V

**Vaccines, possible use of chickens for preparation of, 8**
Prepared by irradiation, 202
**Vaginitis, bovine, silver picrate successful in treatment, 78**
**Valerian compounds in hysteria, 172**
**Vanishing cream, graininess prevented, 11**
**Vasoconstrictors in treatment of common cold, 30**
**Venereal disease, campaign aided by pharmacists, 155**
Social hygiene program, 15
**Veterans Administration raises pharmacist's status, 87**
**Veterinary formulas**
Dusting powder for cattle, 12
Eczema ointment for dogs, 12
Liniment, cattle, 115
Liniment, horses, 115
Silver picrate successful in bovine vaginitis, 78
**Virus elements identified by electron microanalyzer, 122**
**Vitamin C, guava as source of, 122**
**Vitamin dispensing restricted, 205**

W

**Water softeners, 216**
**Whitney, H. A. K., joins du Pont, 151**

Z

**Zeolite, 216**
**Zoeller, E. V., dies, 345**

## INDEX TO AUTHORS

A

**Anslinger, H. J.** Current Problems of Dispensing Narcotics, 135

B

**Bryan, Arthur H.,** Ancient Uses for Insects in Chinese Pharmacy, 218

C

**Clarke, Walter,** Pharmacy's Role in Social Hygiene Program, 15

D

**Dennington, A. R., Uses of Ultraviolet Rays in Pharmacy, 337**
**Downing, J. G.; Ohmart, L. M.; and Stoklosa, M. J., A New Protective Cream, 248**

F

**Fredell, Walter G. and Goldner, Karl J.,** Survey of Current Prescription Pricing, 4

G

**Goldner, Karl J. and Fredell, Walter G.,** Survey of Current Prescription Pricing, 4
**Goodman, Herman,** Dermatologist Discusses Nature and Uses of Bentonite, 249
**Green, Melvin W.,** Action of Drugs on the Parasympathetic Nervous System, 286
Drugs Used for Alleviating Springtime Inflammations, 107
Rationale for Dispensing Common Cold Medications, 28
Sedatives and Hypnotics, 168
**Griffith, Ivor,** president's address, Cleveland meeting, 303

H

**Harris, Lewis E.,** New Uses Develop for Isopropyl Alcohol, 38

K

**Kendall, H. L. and Lee, C. O.,** Rapid Method for Determination of Prescription Fees, 130
**Kuever, Rudolph A. and Maney, Paul V.,** More Active Ointment of Mercurous Iodide, 111

L

**Lee, C. O. and Kendall, H. L.,** Rapid Method for Determination of Prescription Fees, 130

M

**Maney, Paul V. and Kuever, Rudolph A.,** More Active Ointment of Mercurous Iodide, 111
**Mordell, J. Solon,** Outlook of Drug Supplies for Hospital Use, 297
**Moulton, George A.,** A. PH. A. President's National Pharmacy Week Message, 260
Inaugural Address as A. PH. A. President, 333

N

**Neff, J. Louis,** Pharmacists Aid Cancer Control As Health Advisers, 67

O

**Ohmart, L. M.; Downing, J. G.; and Stokiosa, M. J.,** A New Protective Cream, 248

S

**Schwartz, Louis,** Current Views on Cosmetics and Dermatitis, 74
**Silbergleit, A. H.,** Pharmaceutical Aspects of Tyrothricin, 232
**Sister Mary Oswalda,** Developing Better Professional Relations, 116
**Smith, John Edwin,** Providing Hospital Supply Service, 65
**Sobeloff, Simon E.,** To See Ourselves as the Layman Sees Pharmacy, 178
**Sonnedecker, Glenn (Editorials)** A. PH. A. convention invitation, 198
A Great Leader Passes, 322
Asking for Competition, 323
Better Prescription Writing, 93
Education for What?, 284
Interpreting Pharmacy to the Public, 128
Latinic Dirge, 158
Metric Millenium?, 92
On Vitamin Propaganda, 129
Pharmacopoeia and N. F., 230
Pharmacy and Selective Service, 58
Pharmacy Corpse?, 256
Pharmacy Students Go to War, 26
Pharmacy Week, 257
Projects of the A. PH. A. Council, 3
Synthetic Quinine, 159
Venereal Disease, 2
**Stokiosa, M. J.; Ohmart, L. M.; and Downing, J. G.,** A New Protective Cream, 248

T

**Tui, Co,** Pyrogen Problems, 60

W

**Weiner, Marian Nita,** A Student's Views on Improving Pharmacy's Professional Status, 266
**Wells, Julian M.,** Rapid Method for Calculating Isotonic Solutions, 99
**White, Wallace F.,** Pharmacology in Everyday Practice, 208

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